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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,057	12/04/2006	Bernt-Ake Sultan	15691.0001USWO	1873

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EXAMINER
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CHOI, LING SIU

ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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11/13/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/570,057	<b>Applicant(s)</b> SULTAN ET AL.	
	<b>Examiner</b> Ling-Siu Choi	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This Office Action is in response to the Amendment filed 07/21/2008. Claims 12-16 were canceled and claim 17 has been added. Claims 1-11 and 17 are now pending. In view of the Amendment, the rejection of claims 1-11 are maintained and the rejection of claim 17 is withdrawn.

### *Claim Objections*

2. Claims 2-8, 10-11 and 17 are objected to because of the following informalities: (A) claims 2-4, 6-8, 10-11 and 17, line 1, ""Pipe according to" is suggested to be changed to ---The pipe according to--; (B) "A crosslinkable high pressure polyethylene composition according to" is suggested to be changed to -- The pipe according to--; and (C) claim 5, line 1, "Pipe according to claim 1" is suggested to be changed to --The pipe according to claim 4-- because claim 4 instead of claim 1 cites "high density polyethylene" as a limitation.

Appropriate correction is required.

### *Claim Analysis*

3. Summary of Claim 1:

A <u>pipe</u> made of a crosslinkable polyethylene composition containing	
	ethylene silane copolymer resin having a content of silane of about 0.1 to 10 wt % at least one silanol condensation catalyst

wherein the ethylene silane copolymer resin has a density of $> 925 \text{ kg/m}^3$
---

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borke et al. (US 2005/0049343 A1) in view of Swarbrick et al. (US 4,117,195).

Borke et al. disclose a crosslinkable, flame retardant polyolefin insulation composition having improved abrasion resistance comprising: (a) 30 to 90 wt% of a high density silane-containing polyethylene base resin selected from the group consisting of: (i) a blend of a bimodal high density polyethylene resin having a density of  $0.940$  to  $0.960 \text{ g/cm}^3$  with an ethylene-silane copolymer and, (ii) a bimodal high density **polyethylene resin having a density of  $0.940$  to  $0.960 \text{ g/cm}^3$  grafted with a silane monomer**; (b) 5 to 70 wt% of flame retardant; and (c) 0.01 to 1 wt% of **silanol condensation catalyst**, wherein **the content of silane monomer is in the range of 0.25 to 7.5 wt%**, ([0020]; [0024]; claim 1). Since the amount of grafted silane is low, the density of the resulting silane-grafted polyethylene would not be significantly reduced.

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The difference between the present claims and the disclosure of Borke et al. is the requirement of a pipe made from the composition.

Swarbrick et al. disclose a cross-linked extruded product obtained by a process comprising: (A) metering into a screw extrusion machine a polyethylene with proportionate amounts of compounding ingredients comprising a hydrolysable unsaturated silane, a free-radical generator, and a silanol condensation catalyst; (B) blending the compounding ingredients with the polyethylene in a first zone of the extruder to form a mixture and then heating the mixture in a second zone downstream of the first zone until silane groups have been grafted to the polyethylene, the amount of the free-radical generator being sufficiently low to limit direct free-radical cross-linking to a level that will not prevent extrusion of the material; (C) extruding the mixture directly out of the extruder through an extrusion die to form an elongate product of a required final shape which reads on a pipe; and (D) subjecting the elongate product to the action of moisture until the polymer therein is cross-linked (Example 1; claim 1). In view of the compositions of Borke et al. and Swardbrick et al. being substantial identical, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make a pipe from the composition disclosed by Borke et al. and thereby obtain the present invention.

6. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keogh (US 4,707,520) in view of Swarbrick et al. (US 4,117,195).

Keogh discloses a composition comprising (A) a preformed, thermoplastic polymer based on a major proportion of ethylene, **the thermoplastic polymer having pendant silane**

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**moieties of the formula:  $-\text{Si}(\text{V})(\text{V})(\text{OR})$** , wherein R is a straight chain  $\text{C}_{4-18}$  hydrocarbon radical or a branched chain hydrocarbon  $\text{C}_{3-18}$  radical; each V is a hydrocarbon  $\text{C}_{1-18}$  radical or an -OR radical; and (B) about 0.1-5 wt% metal carboxylate as a **silanol condensation catalyst**, wherein **the amount of silane is about 0.05-5 wt%** and the **polymer has a density of about 0.92-0.94 g/cm<sup>3</sup>** (col. 4, lines 36-44; col. 6, line 68; col. 7, lines 1-3; claim 1).

The difference between the present claims and the disclosure of Keogh is the requirement of a pipe made from the composition.

Swarbrick et al. disclose a cross-linked extruded product obtained by a process comprising: (A) metering into a screw extrusion machine a polyethylene with proportionate amounts of compounding ingredients comprising a hydrolysable unsaturated silane, a free-radical generator, and a silanol condensation catalyst; (B) blending the compounding ingredients with the polyethylene in a first zone of the extruder to form a mixture and then heating the mixture in a second zone downstream of the first zone until silane groups have been grafted to the polyethylene, the amount of the free-radical generator being sufficiently low to limit direct free-radical cross-linking to a level that will not prevent extrusion of the material; (C) extruding the mixture directly out of the extruder through an extrusion die to form an elongate product of a required final shape which reads on a pipe; and (D) subjecting the elongate product to the action of moisture until the polymer therein is cross-linked (Example 1; claim 1). In view of the compositions of Borke et al. and Swardbrick et al. being substantial identical, it would have been obvious to one of ordinary skill in the art at the time the invention

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was made to make a pipe from the composition disclosed by Keogh and thereby obtain the present invention.

### ***Response to Arguments***

7. Applicant's arguments filed 07/21/2008 have been fully considered but they are not persuasive.

“Claim 1 of the present application provides pipes with improved pressure resistance.....The copolymer, as described in the application (e.g., at least at page 2 line 30) is the result of copolymerizing ethylene and silane monomer units and **not by grafting silane units onto a polyethylene backbone**. Borke et al. use a grafted bimodal HDPE, as described above. **Borke et al. fails to teach or suggest both the copolymerized ethylene-silane copolymer....**”

Attention is directed to the claim 1 [and claims 2-11], wherein "ethylene silane copolymer resin" can include silane grafted polyethylene and a polymer obtained from the polymerization of ethylene and silane monomer. Thus, claim 1 does not exclude the use of the silane grafted polyethylene. Furthermore, Swarbrick et al. demonstrate the feasibility to make a pipe from the silane grafted polyethylene and the pressure resistance and other properties of the resulting pipe are inherent properties of the material used to produce the pipe. Thus, the rejections of claims 1-11 are maintained.

“Keogh discloses silane copolymers obtained by grafting or copolymerizing compositions for wire and cable applications. Keogh also discloses a **lengthy list of polymers**

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such as alkylene-alkyl acrylate copolymers (col. 4, line 36), ethylene/ propylene, ethylene/butene and ethylene/hexane copolymers (**no density given**) and ethylene homo- or copolymers with a density of 875 to 970 kg/m<sup>3</sup>. Keogh does not disclose a pipe made from the compositions (page 6, first full paragraph, of the Office Action). **Keogh does not disclose the density of an ethylene-silane copolymer obtained by the copolymerization of ethylene and silane monomer units.** Keogh does not disclose, nor did Keogh recognize the importance of copolymerized ethylene-silane

Attention is directed to the following recitation from Keogh (US 4,707,520):

"Preparation of **thermoplastic polymers** having **pendant silane moieties**.. can be carried out by a number of convenient processes, utilizing free radical generating compounds, including:

**A.** Reacting a thermoplastic polymer with an appropriate vinyl silane in the presence of an organic peroxide as described in U.S. Pat. No. 3,646,155, patented Feb. 29, 1972.

**B.** Reacting olefinic monomer with an appropriate unsaturated silane in the presence of a peroxide as described in U.S. Pat. No. 3,225,018, patented Dec. 21, 1965.

**C.** Reacting a thermoplastic polymer with a silane sulfonyl azide as described in U.S. Pat. No. 3,697,551, patented Oct. 10, 1972 (**col.3, lines 40-55**).

**Illustrative of thermoplastic polymers which can be reacted with silanes,** according to Process A, identified above, are normally solid **homopolymers and interpolymers of monoolefins and diolefins**(**col.4, lines 56-59**).

..Exemplary of **olefins** falling within the scope of Formula II are: **ethylene**, propylene, butene-1, pentene-1, 4-methyl-pentene-1, hexene-1, heptene-1, octene-1 and the like.

**Particularly preferred polymers have densities** (ASTM D-1505) of about 0.875 to about 0.970, preferably about 0.875 to about 0.930. These polymers can be prepared by reacting a mixture containing about 50 to about 99.9 mole percent, preferably about 75 to about 96 mole percent ethylene and from about 0.1 to about 50 mole percent and preferably about 4 to about 25 mole percent of one or more C<sub>3</sub> to C<sub>8</sub> alpha olefins as previously described(**col.4, lines 51-60**).

Thus, Keogh does disclose ethylene-silane copolymer having density of 0.875 to 0.970 g/ml.

Furthermore, claim 1 does not exclude the use of the silane grafted polyethylene. Thus, claims 1-11 are maintained.

***Allowable Subject Matter***



8. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The references of record: Borke et al. (US 2005/0049343 A1) and Swarbrick et al. (US 4,117,195) do not teach or fairly suggest the claimed pipe comprising, in particular, an ethylene-vinyltrimethoxysilane copolymer resin.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098. The examiner can normally be reached on Monday to Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Ling-Siu Choi/

Primary Examiner, Art Unit 1796

November 7, 2008